

## THE SURGICAL TREATMENT OF SPLANCHNOPTOSIS.\*

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THE abdominal viscera are kept in their normal position by a nice adjustment of the intra-abdominal tension and the various suspending ligaments. If, in the effort of lifting, or anything else that increases the tension, the muscles are not equal to the increased work put upon them and begin to stretch, the mesentery, mesocolon, gastrohepatic omentum, etc., become taut and thus prevent any further pressure against the abdominal muscles, and no harm results. On the contrary, if an unusually heavy meal, or undue loading of the viscera with solids, or liquids, causes dragging on their several ligaments, the natural tonicity of the abdominal muscles prevents the viscera from being displaced too far, and does not allow too great a strain on the suspending ligaments.

As long as this balance between ligaments and abdominal muscles is maintained splanchnoptosis is impossible. If for any reason it is interrupted, prolapse of the viscera sooner or later is certain. Relaxation of the abdominal muscles, with consequent decrease of intra-abdominal tension, puts an extra load on the suspensory ligaments. They may bear the increased burden for a time, but if it continues they will become gradually elongated and attenuated, and visceral prolapse is the result.

If the weak place is within and the ligaments are first to lose their tone, the abdominal muscles will almost surely gradually relax, and the same condition, splanchnoptosis, results.

In most cases I believe the relaxation of muscles or ligaments is due to a general malnutrition, and it would be hard to determine which was the first to give way. Probably many

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times the stretching of muscles and ligaments is simultaneous, both due to the bodily tone being below par.

Dr. Harris has shown that the kidney is forced out of its normal position because of narrowing of the lower thorax and upper abdomen. This is probably many times a causative factor in general visceral ptosis. I am inclined to believe that in many of the cases the narrowing about the arch of the ribs is an effect and not a cause. When splanchnoptosis exists the most of the abdominal viscera are below the umbilicus. The tendency to produce a vacuum in the upper abdomen causes sinking in at the epigastric region and gradual recession of the lower ribs.

As soon as the descensus of the viscera is an accomplished fact, a train of disagreeable symptoms is manifest. The digestion is impaired, stomach drainage is slow and imperfect, the gastric walls become stretched, intestinal gas is troublesome and painful and constipation becomes pronounced, a greater or less degree of autotoxæmia is always present, and many nervous manifestations occur. In the hands of too many the case is regarded as neurasthenic, but the nervousness should be recognized as only a symptom. Tenderness over all parts of the abdomen is another of the almost invariable symptoms of splanchnoptosis.

That this chain of symptoms is the natural result of visceral prolapse is clear if one stops to think of all the offices served by the suspending ligaments. The blood supply and enervation of the viscera come through the arteries, veins and nerves contained in their ligaments. If these ligaments are elongated, the result can be easily foretold. The return circulation is impeded, and a passive congestion results with decrease in nutrition of the coats of the viscera and perversion of their function. The nerves being stretched, pain and tenderness ensue.

Another important office of the ligaments is to hold the hollow viscera in the most advantageous position to secure results from peristalsis. A viscus in the physiological act of peristalsis, and not held steady by a normal suspensory liga-

ment, works at such a decided disadvantage that little is accomplished. It struggles, to be sure, but its power is not directed properly and the effect is largely lost.

Another function of normal ligaments is to maintain an easy curve in all portions of the gastro-intestinal canal, and thus expedite the smooth and rapid progress of food and food residue from stomach to anus. When these ligaments become overstretched these easy curves are lost and torsion, valvular constrictions, and angulations add much to the distress of the patient, and greatly interfere with his nutrition.

Whatever the remote cause of the condition a fully developed splanchnoptosis presents two anatomical changes that must be reckoned with, the weakened muscular wall of the abdomen and the stretched and attenuated ligaments. To these must usually be added dilatation, to a greater or less degree, of the stomach and intestines, and increased weight of the solid organs, liver, kidneys, and spleen, due to the long-continued passive congestion. The tendency is for the trouble to become progressively worse, for the abdominal muscles to become weaker and thinner, the suspensory ligaments longer and more attenuated, the dilatation and enlargement of the viscera more pronounced.

No treatment, medical, mechanical or surgical, will be successful that does not recognize all the disturbing factors. I do not for a moment believe that any case of extreme splanchnoptosis was ever cured by medical or mechanical treatment. The mild cases do not cause much trouble if left to themselves; and if treated intelligently with the idea of aiding digestion by suitable diet, relieving constipation, and strengthening the abdominal muscles by massage, the descensus may not increase. The severer cases may be sufficiently mitigated by well-known methods to render life bearable. But when the liver drops down three to six inches, the stomach lies below the level of the umbilicus, the mesentery is elongated to double or triple its normal length, and the kidneys move about at will, no difference what the treatment, medical or mechanical, and no matter how persistently the treatment is carried out, the viscera will

remain outside their natural orbits, although sometimes the condition may be made less distressing.

Nine years ago, when I read my first paper on this subject and reported two cases operated on, the criticism was so harsh that I made up my mind to be extremely conservative in the future, and not to operate on any cases unless all possible effort had first been made by all the known medical and mechanical means to relieve the more serious symptoms, and even then not to operate on anyone unless the condition was so severe that life had become practically no longer bearable. This resolution has been strictly adhered to, but I have seven additional cases to report to-day, not counting a large number of nephropexies which will not be considered now, as the time will be more than filled in considering the methods of correcting the descensus of the liver, stomach, and intestines; I will only say that I have considered the kidney by itself. When a movable kidney unquestionably produces serious disturbance, whether or not associated with a general splanchnoptosis, it is anchored. I have been well satisfied with the method advocated in a paper read before this Association in Chicago in 1901.

The charge against operative intervention in splanchnoptosis is that it does not fully relieve and that the correction of the displacement is not permanent. To the first charge the results in my own cases, as well as in the majority of those reported, will bear comparison with the medical treatment of the same cases. Almost every report shows that all medical measures had been tried and failed before operation was thought of. I am willing for any competent internist to have all the opportunity he desires to relieve the condition by non-surgical means in any case that comes into my hands. If he succeeds, well and good; if he fails, it will be time enough then for operative intervention. I hope I have made it plain that no indiscriminate recommendation for operation in all cases of splanchnoptosis is intended.

And now what have been the results of the operations thus far done for general visceral prolapse? In more than seventy cases whose reports I have read, done by all methods, practi-

cally all have been improved. The majority have been so much benefited as to have considered themselves cured, and a good percentage have been reported as wholly cured. In the very nature of the trouble it would be too much to expect that the results would be brilliant. These unfortunate patients cannot be made over. Their tissues are of too poor quality. All that it is reasonable to demand is that these chronic invalids, better dead than alive in their present condition, be so improved that they can again enjoy life, even if denied the vigor of their more fortunate fellows who have never been so afflicted.

There should be a sharp line drawn between true general splanchnoptosis, such as I have endeavored to describe, and those cases where the viscera have been drawn out of position by adhesions. The latter are not regarded in the same category as the former and usually relief of the adhesions would cure without any suspending operation. Only two of my nine cases could in any manner be placed in the latter class.

Various operative procedures have been tried, and it is noteworthy that all the methods seem to have given more or less relief of the more urgent symptoms. Two distinct classes of operations have their adherents:

(1) The prolapsed viscera are in some way sutured or suspended in as nearly the normal position as possible; (2) The abdominal capacity is sought to be decreased by narrowing the abdominal wall by plastic methods.

In the correction of gastropptosis by the first or direct suspension, four different methods have been advocated. In the chronological order of the published reports, they are as follows:

(1) Direct suture of the stomach wall to the abdominal wall (Duret, 1894). Gastropexy.

(2) Suture of the gastrohepatic and gastrophrenic ligaments to the abdominal wall (Davis, 1897). Gastrosuspension.

(3) Shortening of the gastrohepatic and gastrophrenic ligaments (Beyea, 1899, though his first case was operated upon in 1897).

(4) Suspending the stomach in a hammock made by suturing the omentum to the abdominal wall (Coffey, 1902).

Numerous variations of these procedures have been used, but I believe none of them are important, and all follow the principles of one of these four methods.

Two procedures have been used to narrow the abdominal wall and thus lift the viscera to their normal positions:

(1) A shortening and tightening of the abdominal wall in all its diameters by an extensive plastic operation (Depage, 1893).

(2) Resection and suture of the fascia of the recti muscles when there is a wide diastasis (Webster, 1901).

In addition to these procedures gastroplication has been done for dilatation and gastro-enterostomy for drainage of the stomach, poor drainage being regarded by many as the chief cause of distress.

None of these procedures has met with a very cordial reception at the hands of surgeons or internists. None of them can be expected to so perfectly correct the position that the stomach will be as smooth in all its functions as before gastropsis occurred.

Which operation is the best is not an easy matter to decide. That direct fixation of the stomach to the abdominal wall as done by Duret, Rovsing, and Hartman, and so recently done and advocated by Eve, has serious objections. I pointed out September 16, 1897, in a paper read before the Medical Society of the Missouri Valley, when my first two cases were reported, in the following words:

"As all will recognize, the methods adopted by me are a wide departure from those hitherto practised. In operations reported, the stomach has been anchored in position by suturing it directly to the peritoneal layer of the abdominal wall. Surgeons have frequently been called upon to liberate adhesions binding the stomach to the abdominal wall, on account of the suffering caused. I should hesitate to produce artificially a condition which is so likely to be followed by pain. On the other hand, the lesser omentum is the natural ligament of the

stomach, and if it is shortened or receives a new fastening no unpleasant consequences would be expected to follow."

This is a grave objection to gastropexy by the Duret method, and I had supposed it had become obsolete, having been replaced by suspensions through the medium of the ligaments, but was greatly surprised to find an article by Frederic Eve, Surgeon to the London Hospital, as late as April 7, 1906, in which he reports five cases he had operated upon for gastropotosis in three of which he made direct fixation of the stomach to the abdominal wall two inches above the umbilicus. Eve gives as his reason, in one of these cases, for not shortening the lesser omentum, that it was too weak and friable to be depended on. Subject to active peristalsis as the stomach is, it does not seem reasonable that direct fixation will prove satisfactory.

With reference to my method published in 1897, suture of the small omentum near its attachment to the lesser curvature to the abdominal wall as high as possible, it has proven highly satisfactory in the seven cases on which the operation has been done. It is of no more a fixation than the Beyea operation, the stomach swinging from the abdominal wall with the lesser omentum as its ligament instead of from the liver and diaphragm. In two of my nine operations the Beyea method was used. The results were as good as, but no better than, in the seven in which my method was made use of. The chief claim for my method is that it is easier to do, and seems less likely to interfere with the circulation. Again, in many of these cases a hepatopexy is needed at the same time, and it is as well not to have the extra weight of the stomach and colon pulling down on the liver.

I have never made use of the method of Coffey, suspending the stomach in a hammock by fastening the omentum to the abdominal wall. It seems rational and especially applicable in such a case as Eve describes with a lesser omentum so weak as not to be equal to the task of supporting the stomach. The only objection I can see is the possibility of a rotation of the stomach on its axis sufficient to develop a kink at the pylorus.

Gastroplication, in cases of dilatation, seems of little value. If the dilatation is dependent on descensus, when the stomach is raised to its normal position, it will very soon regain its natural size. On the other hand, after plication the dilatation will quickly recur unless the valvular obstruction at the pylorus is corrected.

Gastro-enterostomy has strong advocates, notably Deaver and Walker, and has apparently been followed by fairly satisfactory results. It does not pretend to correct the displacement; it merely prevents the stagnation dependent on the descensus. If, by suspension, the angulation at the pylorus is removed so that the stomach can empty normally the need of gastro-enterostomy no longer exists. That suspension does this has been proven many times. Gastro-enterostomy, even in the hands of the best operators, still has considerable mortality while the suspending operation is practically mortality-free.

The operation of Depage, lessening the capacity of the abdomen by shortening its wall in all its diameters, seems rational, but has serious objections. The ligaments are not shortened, and the unsupported weight of the viscera can scarcely fail to produce a second stretching of the abdominal wall. It seems also to be impossible to accomplish the extensive resection of the wall, as done by Depage, without destroying much of the nerve supply, with resultant paralysis of the muscles and almost certain production of hernia in the course of time, thus producing a condition much worse than the original. The operation is formidable, one of the three cases reported by Depage having died of shock.

The same objections do not apply to the Webster operation, but the diameter mainly at fault is not narrowed. In my observations the worst cases of splanchnoptosis are associated with greater stretching of the vertical than of the transverse diameter.

Whatever suspending operation is adopted, if careful attention is not given to the after-treatment, failure is invited. Several weeks in bed with vigorous massage of the abdominal wall and forced feeding after the operation, seems to promise

most in the extreme cases of splanchnoptosis not relieveable by mechanical and medical means.

In prolapse of the liver Jonas' method of holding up the anterior border by means of the gall-bladder sutured to the abdominal wall, and the method described by Coffey, of shortening the suspensory ligament and reinforcing this by sutures through the liver substance and the abdominal wall, have been used successfully. I have tried both methods, but am coming to depend more and more on shortening of the suspensory and round ligaments.

For prolapse of the transverse colon, Lambotte's method of suturing the wall of the colon directly to the abdominal wall is to be condemned on the same grounds that we condemn direct gastrofexion. It is inviting trouble. The method devised by Coffey for suspending the stomach in a hammock by suturing the great omentum to the abdominal wall, seems even more satisfactory for holding up a prolapsed transverse colon.

In my first case, reported in 1897, the gastrocolic omentum was very long, more than twice its normal length, allowing the transverse colon, after the stomach had been restored to its normal position, to descend much lower than it should. At this time the gastrocolic omentum was reefed by sutures carefully placed so as to avoid interference with the blood-supply. The results were entirely satisfactory, but only one case has been met since, which seemed to require such a procedure, Case VI, in which it was done with apparently perfect success.

Apparently most contributors to the surgical literature of splanchnoptosis ignore the existence of enteroptosis, or consider that suspending the stomach corrects the entire trouble, without any direct effort directed to the small intestines. In most cases this is probably true, but sometimes the mesentery is stretched to two or three times its natural length. In such a condition I can see little benefit in suspending the stomach and liver alone. The buoyancy of the small intestines, forming a veritable air-cushion on which the liver and stomach rest and constituting no little part towards holding these organs in their

normal position, is lost if the intestines sink to the lowest part of the abdominal cavity, as they do when the mesentery is greatly elongated.

In three cases I have shortened the mesentery in the manner described in Case I, reported in 1897. It is done in much the same manner as Beyea shortens the gastrohepatic omentum, except that, instead of folding the membrane on itself by tier suture, only one suture is introduced between the arteriæ intestinae tenuis, and when it is tied it produces a reef. Many of these sutures are used, and as they are tied the mesentery is shortened as much as desired.

All of my cases have done well, as will be seen by reference to the reports at the end of this article. The putting in of these reefs is not nearly so formidable an operation as it seems, if it is carefully done and the blood-supply duly respected. If we expect to accomplish good results in the surgical treatment of splanchnoptosis all of the prolapsed viscera will have to receive attention in the more aggravated cases.

A brief history of cases operated upon is hereto appended.

CASE I.—Mr. E., farmer, aged 62 years. Reported in *Western Medical Review*, October 15, 1897. Will quote from the description of the operation only to show the technic employed: "The stomach was drawn up into its normal position, and the lesser omentum near its reflection upon the stomach at its lesser curvature was fastened to the peritoneum (in a transverse direction) at the level of the ensiform cartilage by means of fine silk sutures. The stomach was not especially dilated, and gastroplication was not performed. The transverse colon was fully six inches from the greater curvature, the gastrocolic omentum having been greatly stretched. A tuck was taken in the gastrocolic omentum, being careful to avoid the vessels, and not allowing the sutures to penetrate more deeply than through the anterior peritoneal layer of the omentum. This shortened the distance between the transverse colon and greater curvature of the stomach to two or three inches. The small intestines were now brought forward and the mesentery found to be so much elongated that the loops of intestines could be raised four or five

inches above the level of the abdominal wall without undue tension. Beginning now near the upper end of the jejunum, a loop was brought forward. To shorten the mesentery without interference with the intestinal blood supply was the problem before me. The isosceles triangles, bounded at the base by the attached border of the intestine and having for their sides the arteriæ intestinæ tenuis, branches of the superior mesenteric, were elongated, the distance from their apices to their bases being three to four inches. Anything might be done to shorten these triangles if there was no interference with the circulation at their borders. Armed with a long, slender needle, carrying No. 4 silk, the needle was inserted near the apex of a triangle penetrating the mesentery in one direction and brought through in the opposite direction at the centre of the base near the attached border. The suture was drawn through and tied, forming a reef in the mesentery at this point and shortening it from two to three inches. After several sutures had thus been introduced and tied in contiguous triangles, close examination showed that the circulation was unimpeded. Sutures were thus used the entire length of the small intestine, not in every interarterial space, but almost that closely. Between the upper jejunum and the ileocaecal valve ninety-two sutures were employed. There was no shock. The patient did well with the exception of some pain in the region of the loosened adhesions. There was no distension. The bowels moved the third day. The patient was up the twentieth day, and left the hospital August 9, exactly four weeks from the day of operation."

CASE II.—Mrs. P., aged 30 years. Reported same time as Case I. Four months after the operation she was doing her own housework, which she had not been able to do for many months, and had gained seventeen and one-half pounds in weight. She had a child about two years after the operation, and was reported in good health one year ago.

CASE III.—Mrs. C. W., aged 26 years. No children; one miscarriage. Three years ago she began having pain in region of stomach and gall-bladder; no acute attacks, but constant pain and distress. Has lost much weight, but cannot say how much.

Has been under Dr. Bridges' care for several weeks in the M. E. Hospital. On examination general abdominal tenderness was present; worst over gall-bladder region. Liver in about

normal position, but stomach greatly prolapsed, extending three inches below umbilicus.

Operation, December 22, 1904. Dr. Decker gave ether; Dr. Hull assisted. Incision through right rectus. Thirty stones removed, and gall-bladder drained. Stomach anchored as in Case I. Uneventful recovery, and reported well six months later.

CASE IV.—Mrs. H. S., aged 23 years. One child; one miscarriage. Began having pain in region of stomach and gall-bladder three years ago, and has been growing worse ever since, having lost twenty-five pounds in weight. General abdominal tenderness; no worse over stomach and gall-bladder than elsewhere. Liver greatly prolapsed, and stomach extends below umbilicus. Also has laceration of cervix and perineum.

Operation, January 10, 1905, at M. E. Hospital. Dr. Decker gave ether, and Dr. Hull assisted. Uterus curetted, and cervix and perineum repaired. Then the liver was raised to its normal position and sutured there by stitches through its border. As this was found to restore the stomach to its normal position, it was not anchored. Gall-bladder normal.

Patient made an uninterrupted recovery; all the old pain relieved; and she was in good condition four months later.

CASE V.—Mrs. E. R., aged 27 years; two children; no miscarriages. A year before entering Immanuel Hospital she commenced to feel pain in the left side of the abdomen. The only position of comfort was on her back. Almost impossible to remain long in the upright position. Frequent vomiting and sick headaches. Constipated. The entire abdomen sore, and has a burning sensation. Much flatulency. At the beginning of her trouble was jaundiced, but had no attacks of colic.

Lower border of stomach midway between umbilicus and pubes; liver also much prolapsed. Both kidneys movable.

Operation, August 19, 1905. Dr. Mason gave ether, and Dr. Hull assisted. Incision in median line above umbilicus. Liver and stomach anchored in usual manner. Made an uninterrupted recovery, but has not been heard from since leaving hospital.

CASE VI.—Mrs. J. M., aged 40 years; seven children; no miscarriages. Good health until the past few years, when she began having pain in abdomen, flatulency, constipation, etc.,

which was not very severe until a year ago, since which time she has been much of the time confined to her bed under the care of her physician, Dr. Fitzsimmons, of Ohio, Nebraska. During the year her weight has decreased from 127 pounds to 97 pounds.

For one month before I saw her she was in Immanuel Hospital under the care of Dr. Milroy, who asked me to see her.

Abdomen universally tender; food causes great distress; nausea and often vomiting. A general splanchnoptosis diagnosed, the liver being three inches below the arch of the ribs, and the stomach entirely below the umbilicus when she stands, with bulging of the lower abdomen. Operation was advised, and with the hearty coöperation of Dr. Milroy and Dr. Fitzsimmons it was carried out November 2, 1905.

Incision in median line from ensiform cartilage to umbilicus. Liver anchored by four double sutures. Stomach anchored and the gastrocolic omentum shortened as in Case I. Numerous reefs taken in mesentery throughout the entire length of the small intestine, the mesentery being greatly lengthened. Uneventful recovery. When she left the hospital, five weeks after operation, she felt better than for many months. Advices from her two weeks ago state that her health is excellent.

CASE VII.—Mrs. M. B., aged 39 years; three children; no miscarriage. Has been having a good deal of pain in abdomen, and flatulency for past year. Constipated. Much worse during past month, and has resisted all treatment. Pain has of late been worse in the left half of the abdomen. The patient has been steadily losing weight.

On examination a general splanchnoptosis found; kidneys, liver and stomach all much prolapsed.

Operation, January 5, 1906. Dr. Mason gave ether, and Dr. Hull assisted. Incision above umbilicus through right rectus. Numerous adhesions found between omentum and anterior abdominal wall. These were broken up, and the liver was raised to its normal position and anchored. The stomach was then suspended by suturing the lesser omentum to the abdominal wall high up. The gall-bladder was normal with the exception of a few adhesions, which were broken up. Through this incision a small fibroid was found on the anterior surface of the uterus, and an adherent left tube. A low incision was now made, and the

fibroid enucleated. The left tube and ovary were found to be tubercular and were removed. The adhesions were probably due to a healed tubercular peritonitis.

The patient made a good recovery, and was discharged from the hospital much improved, but I have not been able to hear from her since.

CASE VIII.—Mrs. J. S. J., aged 59 years; has four children; no miscarriages. About four years ago she commenced to have stomach symptoms—pain in region of stomach, eructations of gas, vomiting, and a considerable amount of nausea most of the time. These symptoms have gradually increased in severity, until she has been reduced to a condition of chronic invalidism, being compelled to keep her bed most of the time.

Examination reveals a prolapsed liver to three inches below the arch of the ribs, and the stomach greatly prolapsed, the lesser curvature half way to the pubes. Tenderness almost everywhere over the abdomen, no greater in the regions of the stomach and gall-bladder than in other regions. Before I saw her Dr. Christie had been treating her in Immanuel Hospital for four weeks, and it was by his advice that the operation was done. Her pain before coming to the hospital had been so constant that she had become more or less a morphine habitué.

Operation. July 27, 1906. Ether given by Dr. Stein, Dr. C. A. Hull assisting. Incision in median line from the sternum to the umbilicus. On opening the peritoneum, in addition to the prolapse described, numerous adhesions were found in the region of the gall-bladder, which was found atrophied and containing several stones, which were removed and the gall-bladder drained in the usual manner. Hepatopexy was first done, using sutures through the border of the liver and the peritoneum as high as possible and also suturing the suspensory ligament. The Beyca method was made use of to shorten the gastrohepatic and gastrophrenic ligaments.

The patient has been undergoing rest and massage treatment, but is now about the hospital almost ready for discharge. She still has some pain, but not to compare with what she had before the operation.

CASE IX.—Mrs. L. H., aged 35 years; two children; two miscarriages. For past two years she has had much gastric and abdominal pain, and for the past year has been most of the time

confined to bed. Vomits frequently; has constipation; resists all treatment.

On examination the liver and stomach were found greatly prolapsed, the greater curvature reaching almost to pubes.

Operation, August 18, 1906, at Immanuel Hospital. Incision above the umbilicus. Liver pushed up into place and anchored. Stomach suspended by the Beyea method. At the present time she is doing well, and has much less pain.

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